Short communication

Pediatric orbital emphysema caused by a compressed-air pistol shot: A case report

A. Navarro-Mingorance*, S.B. Reyes-Dominguez, M.C. León-León

Departamento de Pediatría, Sección de Cuidados Intensivos Pediátricos, Hospital Universitario Virgen de la Arrixaca, Murcia, Spain

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A B S T R A C T

Case report: We report the case of a 2-year-old child with orbital emphysema secondary to a compressed-air gun shot in the malar region, with no evidence of orbital wall fracture. Conservative treatment was applied, and no complications were observed.

Discussion: Orbital emphysema in the absence of an orbital wall fracture is a rare situation. Orbital emphysema is usually seen in facial trauma associated with damage to the adjacent paranasal sinuses or facial bones. To our knowledge there have been very few reports of orbital emphysema caused by a compressed-air injury.

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Enfisema orbital pediátrico secundario a disparo con pistola de aire comprimido: a propósito de un caso

R E S U M E N

Caso clínico: Se presenta el caso de un escolar de 2 años con un enfisema orbitalario tras disparo con pistola de aire comprimido en la región malar. Se aplicó tratamiento conservador y presentó buena evolución sin complicaciones.

Discusión: El enfisema orbitalario en ausencia de fractura de la pared orbitalaria es una entidad muy rara. Normalmente se observa enfisema orbitalario asociado a traumatismos que causan fracturas de los senos paranasales o los huesos faciales. En la literatura consultada hay pocos casos de enfisema orbitalario secundarios a lesiones producidas por aire comprimido.

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* Corresponding author.
  E-mail address: anavarromingo@gmail.com (A. Navarro-Mingorance).

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Introduction

Orbital emphysema is defined as the presence of air in the orbit. More frequently it occurs as a consequence of the passage of air from the nasal fossa or paranasal sinuses to the subcutaneous tissue due to fractures of the lamina papyracea.\(^1\) The clinical case of a 2-year-old patient is presented who exhibited orbital emphysema secondary to accidental compressed-air gunshot in an area far from the orbit.

Clinical case

A male, aged 2, was brought to the Pediatric Emergency Service after receiving a gunshot in the malar region from a compressed air gun. Physical exploration exhibited erosion in the left malar region, left palpebral edema (Fig. 1), absence of pain upon palpation and crepitation of left periorbital region. The normality of ocular movements was verified and a full neurological examination gave normal results. The Ophthalmology team was consulted, submitting the child to a complete ophthalmological examination including ocular fundus and anterior chamber visualization under biomicroscope without detecting ocular involvement. Urgent cranio-facial CT was carried out, which revealed the presence of air in the left orbit and periorbital tissue, preserving ocular globe integrity and without evidence of orbital wall fracture (Fig. 2). The patient was admitted to the pediatric observation room for 12 h, broad range antibiotic therapy was administered and outpatient follow-up and observation were carried out with telephone contact after 3 days and one month, at which time the patient exhibited full recovery without any sequel.

Discussion

In most cases the presence of air in the orbit is due to communication between the orbit and the nasal fossa or paranasal sinuses. Said communication is usually established after a traumatic mechanism that produces orbital wall fracture. These fractures can be secondary to a range of situations and the presence of previous trauma is not an essential condition.\(^1\)

There are causes produced by iatrogeny (in the course of surgical interventions), by local infection or spontaneously without apparent initial causes. Spontaneous orbital emphysema is less frequent and has been related with increased air pressure in paranasal sinuses.\(^2,3\)

Proposed etiology for spontaneous orbital emphysema includes barotrauma which produces microfractures of the ethmoidal lamina papyracea and the ensuing passage of air from the ethmoidal sinuses. Any sudden change in pressure in the paranasal sinuses can produce a fracture of the ethmoidal lamina papyracea and the ensuing orbital edema. The literature includes descriptions of patients with orbital edema on board a plane\(^4\) or in the context of action sports.\(^5\) In addition, with some patients there are no etiological entities and the action mechanism is increased pressure in the paranasal sinuses as a consequence of a Valsalva maneuver such as sneezing or a coughing fit.\(^2\)

In the case described in this report the cause was the direct injection of air through soft tissue after a compressed air shot in an area far from the orbit which did not produce fracture or involve the paranasal sinuses or nasal fossa.

The literature includes descriptions of adults cases due to compressed air shops over the ocular globe and the orbital region.\(^2\) Clinical expressions can range between simple palpebral edema or diplopia, ocular pain or complete loss of vision.\(^4,5\)

It is important to establish the diagnostic suspicion, carry out an exhaustive assessment of mobility and visual acuity. Conventional radiology facilitates diagnosing the presence of emphysema and locating the fracture in 70% of the cases, while it is necessary to carry out orbital CAT in undiagnosed cases by means of simple radiology or when the size of the emphysema needs to be determined.

In most cases, spontaneous resolution occurs within 24-48 h without requiring specific treatment.\(^6\) However, it is
Important to point out that on rare occasions orbital edema can evolve to central retinal artery ischemia due to compartment syndrome at that level, involving neuritis and visual acuity loss. In these cases, air evacuation has been proposed by means of puncture-aspiration with a venous catheter. In all cases it is recommended to avoid Valsalva maneuvers. Occasionally, treatment may require cantholysis or canthotorny, including high-dose corticoid therapy. Antibiotic prophylaxis is indicated in unclean lesions, history of sinusitis or immunodepressed patients.

Orbital emphysema is an infrequent entity in pediatric age. The case reported herein exhibited good evolution with conservative treatment. However, adequate evaluation is essential due to the possibility of severe and irreversible sequels which could be subsidiary to urgent evacuation treatment.

Conflict of interest

No conflict of interest has been declared by the authors.

References


